

**CHAPTER 4 - ALTERNATIVES**  
**LAKE HAVASU CITY MUNICIPAL AIRPORT**  
**LIMITED MASTER PLAN UPDATE**

*Prepared for:*  
*City of Lake Havasu City*

*Prepared by:*  
*Stantec Consulting Inc.*

#### 4.1 INTRODUCTION

Having identified facility requirements to accommodate growth of aviation activity, development alternatives are outlined and evaluated. The process concludes with the selection of preferred alternatives that will best meet the needs of LHC Municipal Airport and surrounding communities.

#### 4.2 TERMS AND DEFINITIONS

Air Operations Area (AOA)	The portion of the airport designed for landing, taking off, or surface maneuvering of airplanes.
Aircraft Fleet Mix	The numerical or percentage breakdown of aircraft into categories based on aircraft engine and weight.
Aviation-Related Commercial/Industrial Development	Business enterprise engaged in services with a strong reliance on air transportation, such as distribution, warehousing, manufacturing, and light industrial.
Commercial Aviation	Aircraft activity licensed by state or federal authority to transport passengers and/or cargo on a scheduled or non-scheduled basis.
Fixed Based Operators (FBO)	A private enterprise engaged in services related to GA, such as fuel sales, aircraft maintenance, aircraft storage, aircraft rental and sales, flight instruction, and crop dusting.
General Aviation (GA)	All aviation activities except those performed by commercial air carrier or military
Non-Aviation Related Commercial/Industrial Development	Business enterprise engaged in services without a direct reliance on air transportation, such as shopping malls, convenience stores, restaurants, and hotels

### **4.3 AIRSIDE ALTERNATIVES**

#### **4.3.1 Runway**

The facility requirements identified the need to extend the runway an additional 2,500 feet for a total runway length of 8,000 feet. The extension would accommodate existing and anticipated aircraft fleet mix.

The 1994 Master Plan also described the requirement for the runway extension and evaluated development alternatives. The recommended alternative was to extend the runway to the north, avoiding significant drainage control constraints to the south and allowing for precision approach capabilities. This alternative has been designed and the runway extension project is scheduled to go out for bid in May 1999 under Lake Havasu City (LHC) Project Number A-106-97.

The designed runway extension would require re-striping and re-configuring the tie-down spaces and taxilanes on the apron located off the north end of Taxiway A. LHC Municipal Airport is classified as a C-III airport. Per Federal Aviation Administration (FAA) standards for C-III airport reference code, the runway-to-aircraft parking area separation standard is 500 feet. This distance impedes the apron by approximately 32 feet, impacting the tie-down spaces located along the eastern edge of the apron (Exhibit 4-1). The impact can be remedied by re-striping and re-configuring the apron layout.

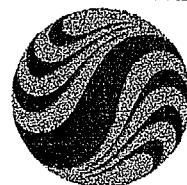
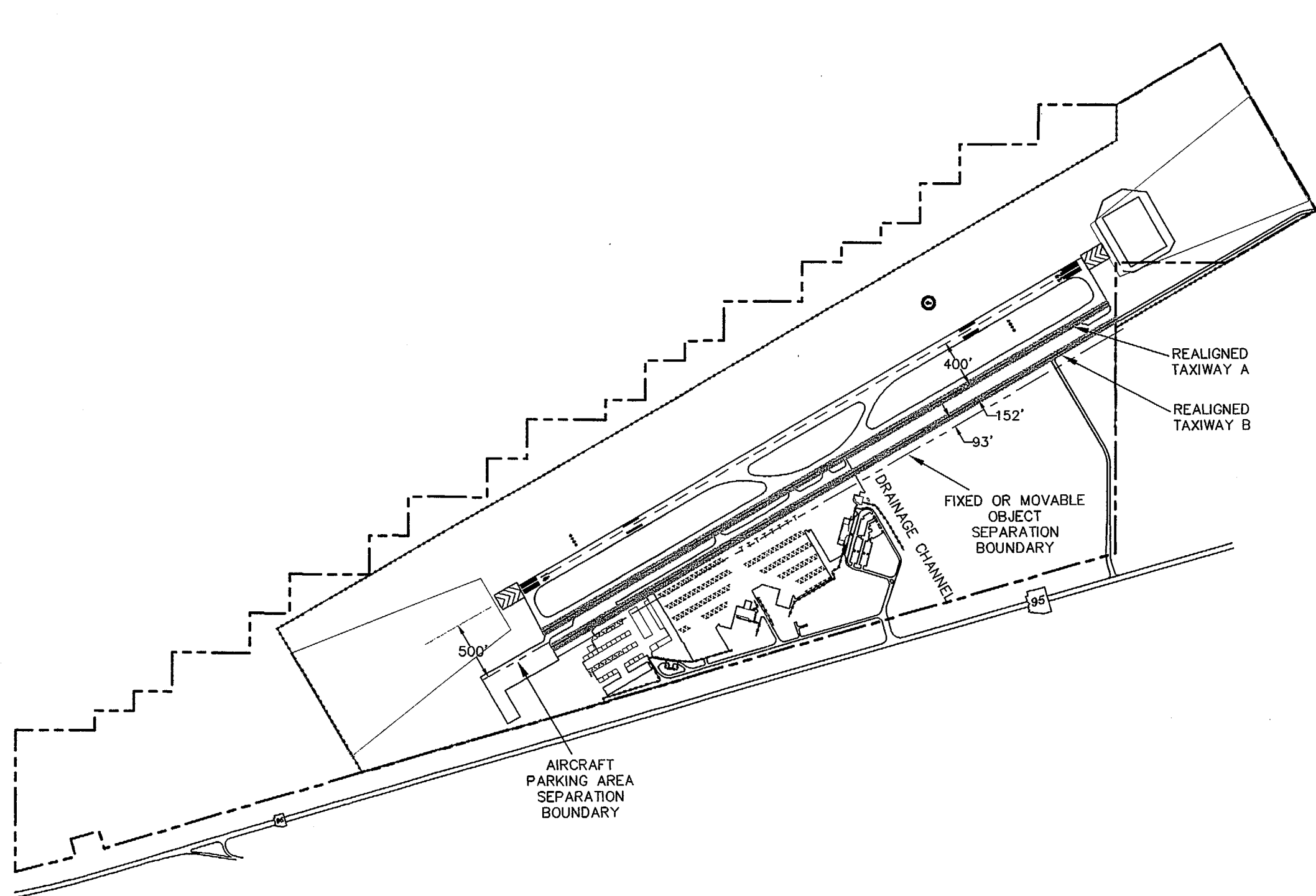
Nevertheless, the Limited Master Plan Update recommends the current runway extension design as the preferred alternative considering the extensive evaluation process the 1994 Master Plan undertook, the City support and adoption of the 1994 Plan, and the current status of the runway extension project

#### **4.3.2 Taxiway**

Although the current taxiway system can accommodate estimated growth of aviation activity, certain taxiway development options require consideration.

##### **Taxiway A Extension**

The recommended runway extension alternative includes an equally extended parallel Taxiway A. It is also designed and listed under LHC Project Number A-106-97. Extending Taxiway A with the runway project will maximize the cost effectiveness of the two projects and maintain an efficient and safe runway/taxiway system. Therefore, it is recommended that Taxiway A be extended per the runway project.



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EXHIBIT 4-1  
Taxiway A Realignment

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### **Taxiway A Realignment**

Currently, the separation between Runway 14/32 and Taxiway A does not meet FAA standards for category C-III airport reference code. The FAA standard calls for a 400-foot separation, however, the existing separation is actually 340 feet between runway centerline and taxiway centerline.

Taxiway A needs to be relocated 60 feet west of its present location in order for LHC Municipal Airport to comply with the FAA standard. As Exhibit 4-1 illustrates, the realignment of Taxiway A also calls for moving Taxiway B in order to maintain taxiway-to-taxiway separation standards. Consequently, the relocation of Taxiway A would impact approximately 73 tie-down and 11 hangar existing spaces.

An option LHC Municipal Airport may wish to exercise is to request a modification to standards from the FAA, which is the recommendation of the Limited Master Plan Update. The FAA would conduct their own study, basically ensuring that the level of safety provided by the 340-foot separation at LHC Municipal Airport is comparable to the level of safety provided by the 400-foot separation in the design standards. They may also require that certain criteria be met before approving the request for modification.

## **4.4 LANDSIDE ALTERNATIVES**

GA and commercial/industry facility development is primarily tenant-driven. The nature of the tenant and individual user requirements will determine specific needs. That is, the Airport typically provides basic infrastructure, access, and building sites and the actual design and construction of the facilities are undertaken when the needs are realized. Currently, the project for the future commercial aviation area is in design and programmed under LHC Project Number A-106-97. With that in mind, the objective of the Limited Master Plan Update is to outline alternatives to land use areas for accommodating growth of aviation activity.

Prior to defining alternatives to the layout of land uses, certain factors pertaining to properties within the vicinity of the airport need to be identified. Due to the close proximity to the Mohave Mountain range, the area east of the runway is considered unusable except for installation of navigational aids and drainage control. Privately owned property, adjacent to the south border of the airport, is considered not congruent with the functions and operations of the airport. The property impedes on the runway safety area and other critical areas associated with the air traffic operating in and out of the airport. The Limited Master Plan Update recommends that LHC Municipal Airport acquire this property to ensure the integrity of the air operations area.

In addition, it is also recommended that LHC Municipal Airport acquire the State Trust Lands and City-owned property south of the airport as ultimate reserve property. The acquisition recognizes that to protect development options on the current airport, ultimate needs should be

considered. It should also be noted that both the FAA and Arizona Department of Transportation, Aeronautics, support the acquisition of land adjacent to the airport for the purpose of protecting the airport environs through compatible land use as well as accommodating long-term development needs. Thus, the City should actively pursue land acquisition to preclude residential encroachment in consideration of noise and safety issues associated with the airport and to ensure ample property is available for airport-related development beyond the current planning window. Further, this would bring the airport in line with the goals of the North Havasu Specific Plan, which was adopted by City Council in 1989. The North Havasu Specific Plan encompasses the General Plan, which designates land in the North Havasu Area for industrial, commercial, and open space uses, implementation policies, and supporting findings particular to North Havasu in the areas of land use, public facilities and services, and transportation.

#### **4.4.1 Land Use Alternative 1**

##### **General Aviation Land Use**

Existing GA facilities expand from midfield to the north, between the airfield and State Route 95. The hangars are consolidated north of the FBO area at the end of the access road, while the tiedown spaces extend from the hangars to the terminal ramp area. Newly added aprons with tiedown spaces are located at the north end of Taxiway A and south of the commercial ramp.

The first land use alternative (Exhibit 4-2) would have future expansion of GA facilities continue on the open spaces adjacent to the existing GA facilities. The area is available for additional hangar and tiedown spaces. Actual development of hangars or tiedown spaces would be determined when the specific needs are realized.

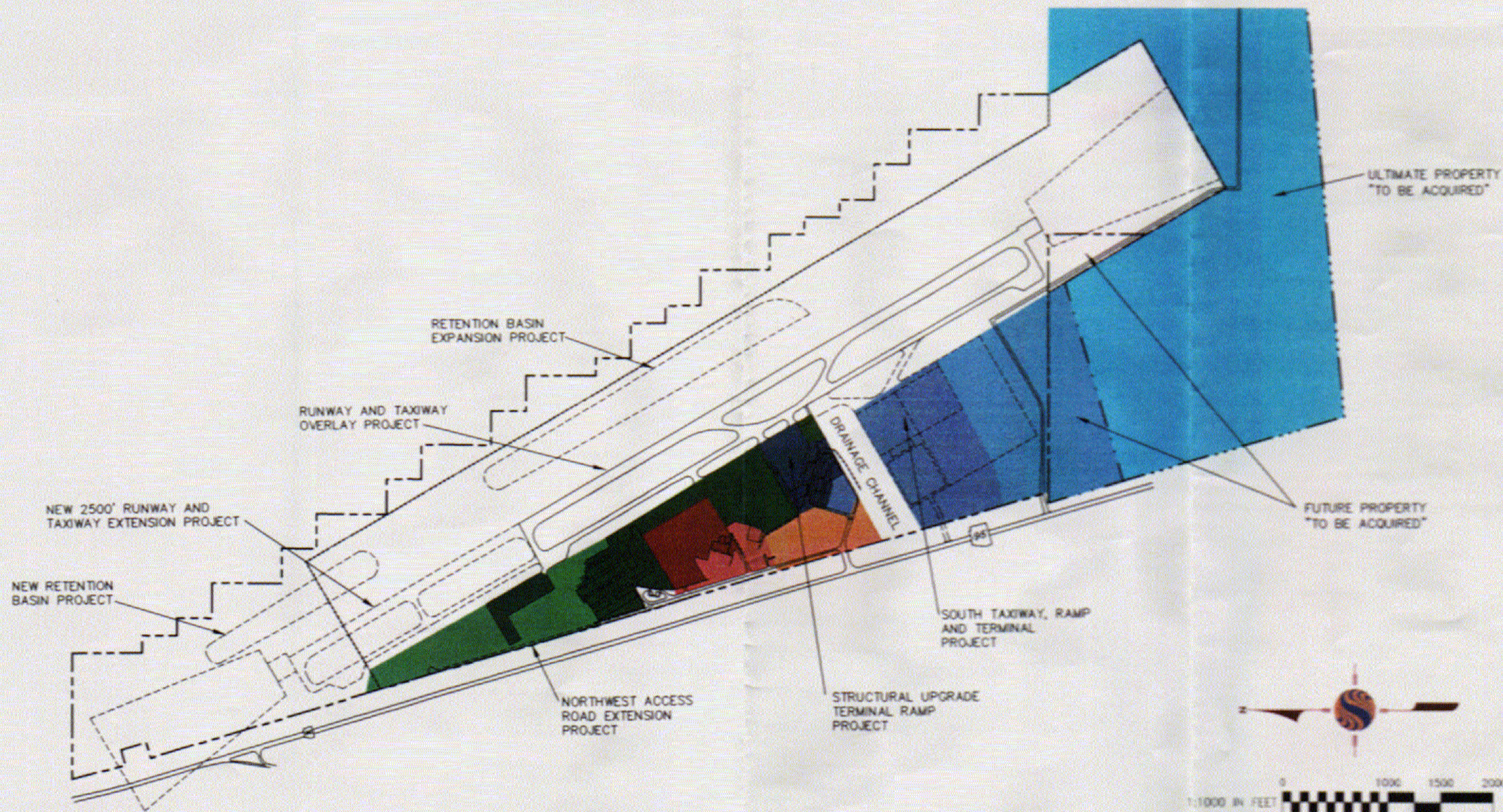
##### **Fixed Based Operator Land Use**

The area designated for FBO use is concentrated south of the hangar area. Facility development would occur between the apron and access road per the first land use alternative. The actual apron boundary between FBO and GA use can be shifted and positioned based on need.










##### **Commercial Aviation Land Use**

Existing commercial aviation facilities are located mid-field, north of the drainage channel. Currently, the future ramp and terminal project is under design and planned south of the drainage channel. Land Use Alternative 1 maintains the existing commercial aviation area, incorporates the planned project, and identifies additional development to expand south from current project.





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	Existing GA Land Use		Existing Commercial Aviation Use		Ultimate Aviation Related Commercial / Industrial Reserve
	Future GA Land Use		Future Commercial Aviation Use		Non-aviation Related Commercial / Industrial Development
	Existing FBO Land Use		Future Aviation Related Commercial / Industrial Development		
	Future FBO Land Use				

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EXHIBIT 4-2  
Land Use Alternative 1



**Aviation-Related Commercial/Industrial Land Use**

Aviation-related commercial/industrial land use refers to business enterprises engaged in services with a strong reliance on air transportation. Examples include distribution, warehousing, manufacturing, and light industrial. The first alternative designates the area south of the airport for future aviation-related commercial/industrial land use. Ultimate development is identified to continue expanding south into the existing State Trust Lands and City-owned property. This area is identified as reserve for development that is expected beyond the planning period or earlier if growth exceeds projections.

**Non-Aviation Related Commercial/Industrial Land Use**

Business enterprise engaged in services without direct reliance on air transportation is considered non-aviation related commercial/industrial land use. Examples include shopping malls, convenience stores, restaurants, and hotels. The first land use alternative designates the entry way into the airport up to the apron as non-aviation related commercial/industrial land use.

**4.4.2 Land Use Alternative 2**

A second alternative for land use (Exhibit 4-3) at LHC Municipal Airport redefines the boundary between GA and FBO land uses while extending into the existing commercial aviation area, and relocates commercial aviation completely south of the drainage channel

**General Aviation Land Use**

Land Use Alternative 2 would have GA development occur north and south of the existing facilities. The development option is opened to different scenarios. One scenario could be that GA expands south after it exceeds the availability of space on the north side. Another scenario is that new development occurs north in the open spaces, while expansion utilizing existing facilities occurs south.

**Fixed Based Operator Land Use**

FBO use would expand south into the existing commercial aviation area per the second alternative. It provides the advantage of utilizing existing facilities although it is subject to availability. Basically, FBO expansion would be constrained from moving into the commercial area until the new south taxiway, ramp and terminal project was completed.

**Commercial Aviation Land Use**

With the objective of maintaining a contiguous commercial aviation operations area, this alternative proposes that existing commercial aviation uses and all future development take place



south of the drainage channel. Currently, the new south taxiway, ramp and terminal project is under design and programmed to begin in 1999. Once completed, commercial aviation can move into the new facilities.

#### **Aviation and Non-Aviation Related Commercial/Industrial Land Use**

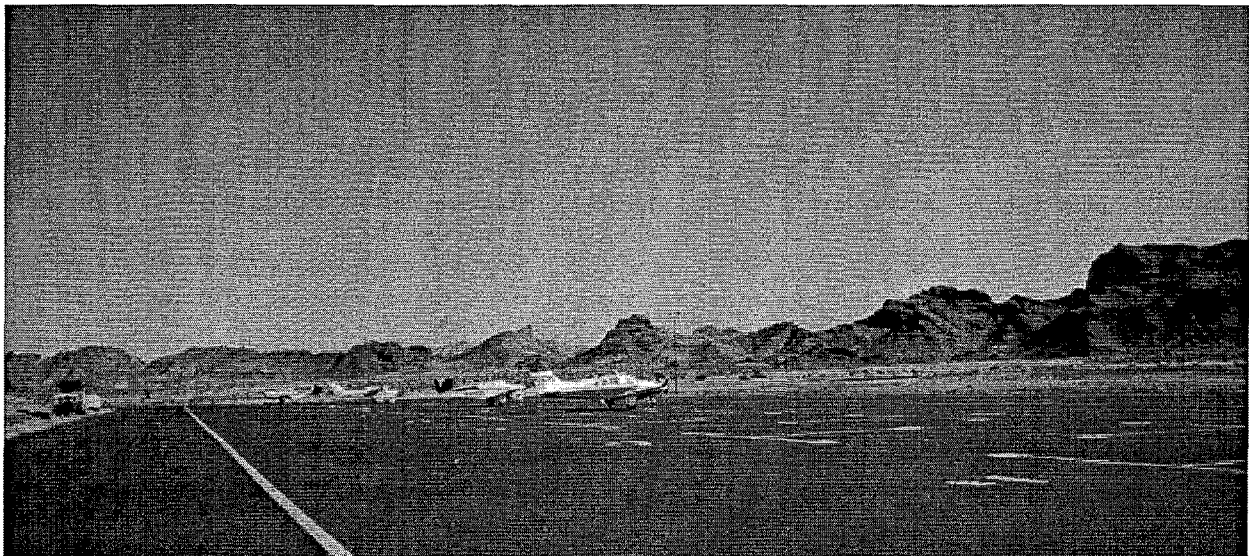
Alternative Land Use 2 identified the same areas for both aviation and non-aviation related commercial/industrial land use as Alternative Land Use 1.

#### **4.4.3 Preferred Alternative**

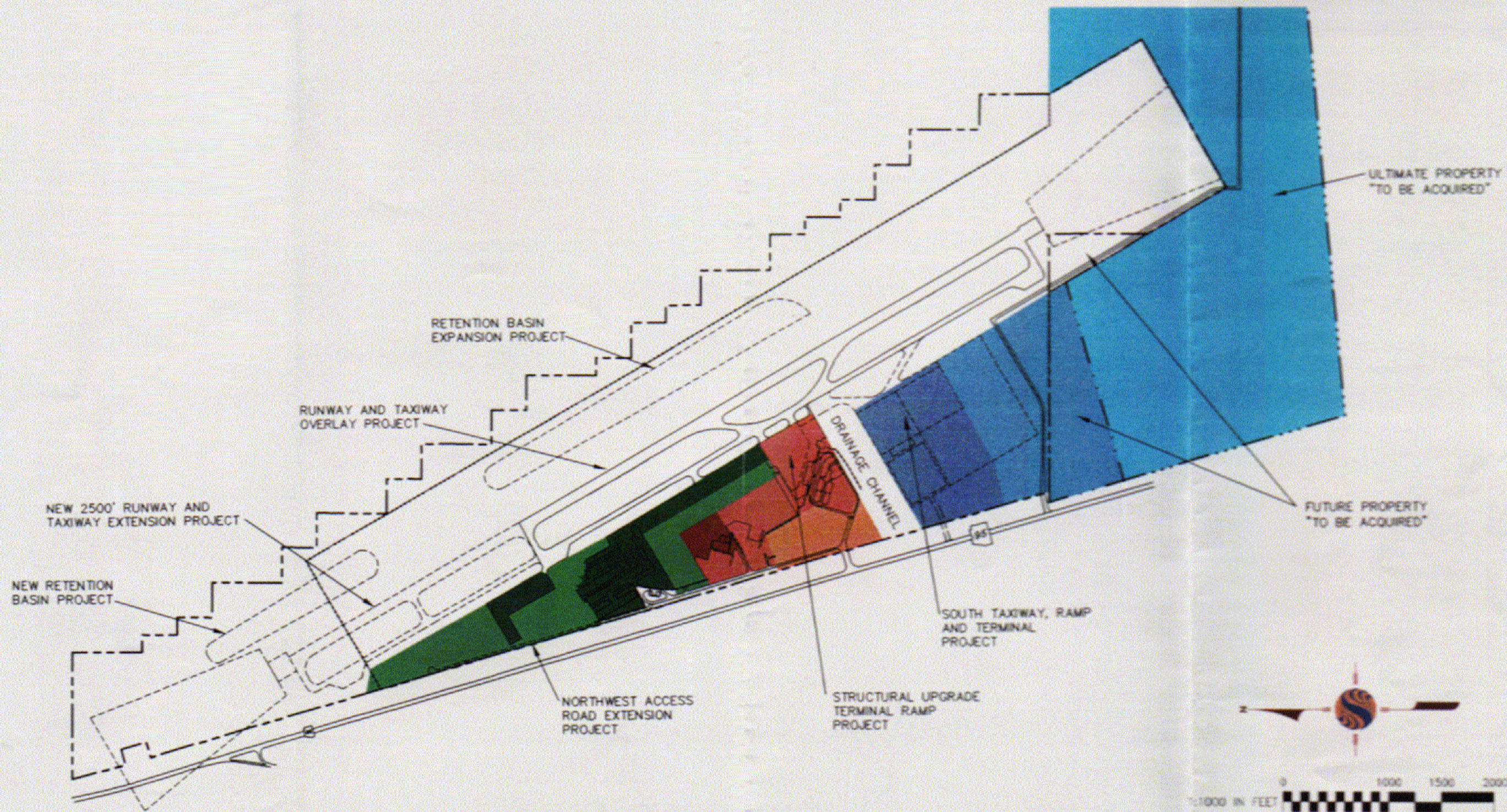
As part of the Limited Master Plan Update process, the development alternatives were presented to Lake Havasu City staff and the Airport Board for review, evaluation, and recommendation. During the Airport Board session of March 10, 1999, the Board approved the Limited Master Plan Update's recommendation for airside development and selected Alternative Land Use 2 as the preferred alternative.

The Board cited two primary reasons for selecting the second alternative. First, the Board agreed with the logical reasoning for maintaining a contiguous commercial aviation operations area. The inherent advantage in separating commercial aviation from GA/FBO is that the airport can maintain better control of these areas and, thus, keep the commercial area secured. The second reason cited was that the Board felt the second alternative allowed more flexibility in the FBO land use, particularly, the possibility of more than one FBO service provider.

The Limited Master Plan Update will proceed with incorporating the Airport Board's selection and approval of alternatives into the planning process to form the elements of development that include the Airport Layout Plan drawing and Financial Plan.







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Existing GA Land Use  
Future GA Land Use  
Existing FBO Land Use  
Future FBO Land Use

Existing Commercial Aviation Use  
Future Commercial Aviation Use  
Future Aviation Related Commercial / Industrial Development

Ultimate Aviation Related Commercial / Industrial Reserve  
Non-aviation Related Commercial / Industrial Development

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EXHIBIT 4-3  
Land Use Alternative 2